

UNITED STATES PATENT OFFICE.

ROBERT LEON CAMPBELL, OF TUSKEGEE, ALABAMA, ASSIGNOR OF ONE-HALF TO BOOKER T. WASHINGTON, OF TUSKEGEE, ALABAMA.

VALVE-GEAR FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 728,364, dated May 19, 1903.

Application filed December 8, 1902. Serial No. 134,353. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LEON CAMPBELL, a citizen of the United States, residing at Tuskegee, Alabama, have invented certain new and useful Improvements in Valve-Gear for Steam-Engines, of which the following is a specification.

My invention relates to improvements in reversing valve-gear for stationary, locomotive, and marine engines.

My object is to provide a simple and efficient construction whereby the direction of the engine may be changed with a minimum amount of friction and as good results secured with a single eccentric as are ordinarily accomplished by two.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation showing the improved valve-gear applied to a stationary engine of the vertical type. Fig. 2 is a sectional elevation.

Referring by reference-letters to these figures, H designates a link of substantially the ordinary form, which is centrally pivoted at O and has one end connected by a rod K and strap K' with the eccentric R, secured to the crank-shaft Q.

G designates a cross-bar which is rigidly secured to the cross-head G' of the engine by suitable means, such as a screw M. A link D is connected at one end to this cross-bar G by a screw E, while the opposite end of said link D is connected by a screw P with the outer end of a lever-arm A. The inner end of the lever-arm A is connected by screw-pin C with the valve-rod S.

A rod F has one end pivotally connected with the arm A at a suitable distance from the pivot C, while its opposite end is connected to the block which slides in the link H. N designates the shifting link, which is connected at one end, as shown, to the lower end of the rod F, while its opposite end is pivotally connected at L to the shifting-lever V, the position of which is controlled in the ordinary manner by pawl T engaging segment T', and operated by lever V and connecting-rod V'.

By the above construction it will be seen that I provide an extremely simple and efficient form of valve-gear in which all neces-

sary results are secured by the use of a single eccentric.

It will be noticed that the eccentric is set on the shaft at an angle of ninety degrees with the wrist or crank pin, which cause the valve to close the ports too quickly for practical use unless some provision is made to arrest the movement of the valve at the proper time. In lever A, connecting-rod D, and cross-bar G, connected to each other and to the cross-head, I have the arrangement that will cause the valve to close or open the ports at any desired portion of the stroke, which can be arranged by lengthening or shortening the stroke of the eccentric and shortening and lengthening the stroke of the lever arrangement. When the stroke of the eccentric is shortened, the stroke of the lever must be lengthened, and vice versa. Thus I have an arrangement that is simple and practical.

Having thus described my invention, what I claim is—

1. In a reversing valve-gear for steam-engines a single eccentric, a rocking link having one end connected with the eccentric, a lever-arm having one end pivotally connected to the valve-rod, a direct connection between the other end of said lever-arm and the cross-head whereby the said other end and piston-rod move in unison, and a rod having one end pivotally connected to the lever-arm and forming a fulcrum therefor, and its other end adjustably connected to the rocking link, substantially as described.

2. In a reversing valve-gear for steam-engines, a single eccentric, a rocking link having one end connected thereto, a cross-arm mounted to move in unison with the piston-rod, a lever-arm pivoted at one end to the valve-rod, a link connecting the end of the lever-arm directly to the cross-arm, and a rod having one end pivotally connected to the lever-arm and its other end adjustably connected to the rocking link, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT LEON CAMPBELL.

Witnesses:

S. B. THOMAS,
E. J. JONES.